

SINC - LINK

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TORONTO TIMEX - SINCLAIR USERS CLUB

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The annual meeting has been held and we are at the start of a new season. Club officers for the coming year have been elected, membership is holding up, and we can look forward to another successful year.

I would like to draw to the attention of our members the resources which are available to them in our paper library. I think that many members are simply unaware of the large amount of material which the library has accumulated during the past year.

1. A series of binders of Club newsletters that we have received on an exchange basis with other clubs.

2. A compendium of magazine articles on the ZX81 computer which have been assembled into two binders.

3. A similar collection of magazine articles for the TS 2068 computer.

4. A collection of 30 books dealing with the ZX81.

These include just about every book on the ZX81/TS1000 to be found in Toronto bookstores. A contribution by one of our members.

5. Five books on the Spectrum/TS2068.

6. A collection of about 20 books on various computer topics, such as Artificial Intelligence, Speech Generation, CP/M Primer, Basic: Fundamental concepts, etc., etc. Another member donation.

7. A copy of each issue of the magazine ZX COMPUTING for the past year or so.

The library has an index for each of the items 1 to 6 mentioned above, which you may look over to get an idea of what might be of interest to you. Ask our librarian, John Burns, for them.

Be a computer bookworm this winter. Borrow one or two books with your library cards. Find out more about computing and your computer.

George Chambers.

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The <EXPANDING> Text Line

ZX81/TS1000/TS2068 2K or more RAM. by Peter McMullin AUG. 85.

After having gotten my feet wet writing some software, it became a challenge to present introductory or instructive text sequences in an interesting way.

I spotted the cover screen for an IBM software package which was a real eyecatcher: each line of text appeared to scroll outwards into place from the centre of the screen. The Sinclair BASIC string-handling features lend themselves well to this sort of thing. A trivial routine like this must (and this one does)

fill 3 requirements:

1) Executes quickly enough to achieve a specific (desired) effect.

2) Easily coded in BASIC.

3) Uses very few bytes.

If you use the subroutine in a long BASIC program, put it near the start of the program, where it will execute more quickly.

The listing should be self-explanatory- the text input string A\$ must not be longer than 32 characters. An additional benefit is that the routine centres all text on the screen.

Can you see why LINE 100 is necessary? If not, DELETE line 100, then RUN and see what happens with odd-length strings.

Here's the Listing: have some fun!

```

5 REM  E<X<P<A<N>O>I>N>G TEXT
10 LET LINE=2
20 PRINT AT 0,0;" ENTER A TEXT
STRING <32 CHR$ "
30 INPUT A$
40 GOSUB 100
50 GOTO 30
60 REM
70 REM  <P<R<I>N>T> SUBROUTINE
80 REM
100 IF LEN A$/2<>INT (LEN A$/2)
THEN LET A$=A$+" "
110 LET END=LEN A$
120 LET MID=END/2
130 FOR N=1 TO MID
140 PRINT AT LINE,16-N;A$( TO N
+A$(END+1-N TO END)
150 NEXT N
160 LET LINE=LINE+2
170 RETURN

```

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 SINCLAIR PRODUCTS. FIND THAT
 HARD TO GET ITEM. NEED AN
 ANSWER TO A SOFTWARE OR
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Ian Robertson

UPDATES: The Larken Electronics Disc Drive Interface, which was purchased by four of our members, is constantly being updated by Larry Kenny as promised. He is in the process of sending out a revised epron (2k DOS) to all owners (at no extra cost - how about that for customer relations). This improved DOS incorporates revisions for all "bugs" reported by users. We will wait and see if it is more user friendly, which seems to be the only negative aspect of this product. If you are a hobbyist, it still is the cheapest entry into the world of DD's. While on the subject of mass storage, I want to state that this column is being written using a Spectrum emulator, microdrive adapter, the Interface 1, two Sinclair microdrives (one for Tasword/Tasprint and the other for file saves/loads) and a Teo PX-80 printer. The microdrives are just great! Some time ago I wondered, in print, why someone was not marketing a keyboard overlay for the 2068, so that some games and in particular Tasword 2 could be used easily by someone who was not using the programs constantly. Well, Bob Dyl of The English Micro Connection is selling a semi-rigid plastic overlay for \$3.00 each. Needless to say I bought a couple and now my wife can use Tasword without referencing the manual (or calling on me every few minutes either). Mass storage again - Peripherals Direct Ltd. P.O. Box 4301 Northbrook IL 60065 phone 312-498-9244 (they take plastic) is selling the AMDEK AMDISK III 3" disk drive system for \$125.00 US plus \$17.00 US for UPS delivery. The system consists of 2 - 3" drives and a power supply, in a cabinet complete with on/off switch and DD cable. While the 3" disks are NOT available locally, they are available from PBL and other vendors in the US and the UK. UPS will clear/pay customs charges for you for \$28.81 CDN. Total price delivered to your door is \$225.00 CDN.

TS2068: There are definately some Spectrum programs which will not run on a 2068 with a Spectrum Rom, even with the 10k pullup resistors installed on all data lines. One such program is Formula 1 Simulator by Mastertronic. It runs perfectly on my Spectrum +, but will not run on a 2068. Bob Dyl, of EMC, is selling a Spectrum keyboard for the 2068. It has apparently been revised to 2068 key legends, etc. The only question is "how does it handle the cartridge port"? We will have to wait until Dave Ridge gets the one he has on order. It could be another step towards serious usage of the 2068. I am presently in correspondence with Tony Gomez 2013 8 3 Los Feliz Thousand Oaks CA 91362, regarding his work with putting 2068 programs onto eprons which will be run on an Oliger cartridge board. He has already put NTERM and TASWORD II onto eprons, both as individual programs or as a combination on 2x27128 eprons. The eprons will only be sold to bona fide owners of the cassette software. Owners of pirated copies are persona non grata. If you write to Tony please enclose a SASE. If you do not have a U.S. stamp please see me as I always have a supply on hand. Tony is interested in hearing from either potential customers or from someone with ideas. Tony has also given me a list of local BBS's on FIDONET, which is an international electronic mail system. Since the closest is just down the street I am going to investigate. I have been advised (by Canada Remote) that FIDO nodes are in London U.K. I hope one is in Oxford, so that we can keep in communication with Cameron Hayne during his one year

stay at Oxford U. The cost per message is really quite cheap, i.e. 30 cents per message. Zebra Systems Inc., 78-06 Jamaica Ave., Woodhaven, NY 11421, telephone 718-296-2385, is advertising the 'OS-64 Enhanced Operating System Cartridge'. Available September it is supposed to turn the 2068 into a 64 column computer. And the cost is only \$29.95 (US).

SPECTRUM: First of all the Brits have taken to calling the Spectrum - "Specsy". A bit cutesy, but it takes up less space. My latest gadgets are the SLOWO SPEED CONTROLLER (Mid Valley Micro Products), INTERFACE III (Bob Dyl of EMC) and the MM TAPELOADER (Celina Ltd.). The Slowo device allows us slow games players a chance to either play the game at ANY SPEED or to freeze the screen (for perusal). It is probably the most compact, best assembled device I have bought to date. Both the Tapeloader and the SLOWO only works with a Spectrum, they will NOT work on 2068 (in either mode). But with a Spectrum they are sensational. The TL has an active filter on Load and a passive filter on Save. You can actually use a lower volume to load "Specsy" programs. Lastly, Interface 3 allows you to save ANY program to microdrive. I can report that IF3 works on a 2068 with an emulator. I have been asked a few times lately about UK Sinclair magazines. The following is an almost complete list of them (with cost quoted in pounds sterling) ----- (1) YOUR SPECTRUM, Subscriptions, 14 Rathbone Place, London W1P 1DE, U.K., cost is 25.00 ---- (2) ZX COMPUTING, Subscriptions, Infonet Ltd., Times House, 179 The Marlowes, Hemel Hempstead, Herts. HP1 1BB, U.K., cost is 15.00 for 6 bi-monthly issues ---- (3) SINCLAIR USER, ENAP Business and Computer Publications Ltd., Priority Court, 30-32 Farrington Lane, London EC1R 3AU, U. K., cost is approx. 36.00 ---- (4) YOUR COMPUTER, Subscriptions Manager, Business Press Int. Ltd., Oakfield House, Perry Mount Rd., Haywards Heath, Sussex RH16 3DH, U.K., cost 22.50 ---- (5) CRASH MICRO, P.O. Box 10, Ludlow, Shropshire SY6 1DB, U.K. (cost/contents unknown, as believe it or not this is one that I do not subscribe to). Time again to say something nice about a vendor -- THOUGHTS & CROSSES, 37 Market St., Heckmondwike, W. Yorks. WF16 0EU, U.K. My receipt time has consistantly been 12 to 18 days from posting the letter and they even take plastic !!! They usually have a full page ad in all of the magazines listed above. They carry software and hardware, at reduced prices. I usually buy my HW/SW from either T&C or Bob Dyl of EMC. Both give me good service and both carry almost complete Spectrum lines. Bob does not take plastic, but he is only a phone call away to verify stock, price etc.

TELECOMMUNICATIONS: Since this is such an interesting topic I had to comment. Compuserve, Fidonet, Envoy 100 and local BBS's are all accessed by local telephone numbers. If this does not interest you then the possibility of downloading and uploading programs, memos, messages etc. might be of interest. To illustrate - David Ridge's article was uploaded by David, on his Radio Shack Model 100 yet, then down loaded on my 2068, as I was seeing John Roach (our editor) first. See the possibilities!

TS1000: Since Peter does such a great job reviewing the 1000 world I am only going to make one comment. Does anyone know if NTERM (Smart Term II) is available for the 1000. If it is I sure would like to know about it so I can order a copy. If not I will have to get "Mini Xmod 1.7" from Zebra Systems. It also uploads and downloads and is for the TS1000.

Welcome to another exciting roundup of resources for ZX81/TS1000 users! To reinforce my comments in the Aug. issue, I offer two unequivocal statements for the record:

- 1: Yes, ZX81 user support has moved "underground".
- 2: NO, the ZX81 support market is NOT dead!

Because of fact#1 (despite fact#2 ?), I am constantly encountering fellow computerists who simply don't know where to turn for information about support for their computer. The state of the ZX81 market is such that user participation, communication, and mutual support are absolutely crucial. When Timex pulled the plug, so did many of the larger aftermarket support companies. What did that leave? The truly dedicated supporters and enthusiasts who saw the potential of the machine, rather than just the dollar signs in an "up" market.

Fact is, folks (newcomers and old hackers alike): the free rides are (long since) over. It's up to US to support suppliers with our business if we expect them to continue. It's up to US to communicate with each other- to share information and ideas. I speak from both sides of the fence here: Timex's exit has rendered us equal, supplier and user alike, in mutual support requirements.

Many newcomers to ZX land have expressed concern that there isn't much ZX81 support available these days. NOT SO! A lot of the extraneous garbage (which certainly padded out the appearance of the marketplace) has disappeared, but what's left is the cream of the crop: Name virtually any conceivable software application, hardware upgrade, or communications support that was ever available during the "Timex peak": all the best is still available, and will continue to be for a while. My list is still growing, not shrinking!

Now arise the questions:

- "How do I find out who this stuff is available from?"
- "Where and how can I learn more about my computer, and share what I've discovered with others?"

Fortunately, there are several answers. Participate in the activities of your local User Group. Get to know the skills & interests of other members- and make yours known, too. There's ALWAYS someone who can benefit from knowledge you may take for granted. Similarly, those who don't ask don't get. DO NOT be embarrassed to ask questions of more experienced users. We all must start somewhere. I've never met an unfriendly ZX user!

There is no rule that says you can only belong to one User Group. Currently, in addition to at least 5 dedicated "real magazines", there is a large (and growing) number of active User Groups across the continent, many of which publish excellent Newsletters. By subscribing to a few of these publications, you will find yourself overwhelmed at the resources available to you. Your interaction with support publications should NOT stop with your subscription check! The articles & letters you read were contributed by someone just like you. So if you have a program you've written, news you'd like to share, praise, or a gripe, then write about it and send it in! Most newsletters also offer free classified ads to subscribers as an additional benefit.

To help you make some rewarding contacts, a new section has been added to the ZX News column, called "RESOURCES". In this and following instalments, along with the usual reviews, tips, & news, several reliable sources of ZX81 user support will be listed with brief descriptions. Now, on to the good stuff!

RESOURCES:

This month: 5 of the "most important" publications for the T/S enthusiast. (In no particular order)

TIME DESIGNS MAGAZINE

29722 HULT RD.,

COLTON, OREGON 97017

-6 issues/year for \$15.00 U.S., to the U.S. or Canada.

-About 34 pages/issue. Very nicely produced, with an excellent advertising section & very good editorial content. Started out a little "2068-heavy", but 1000/ZX content is steadily increasing. Each successive issue looks more exciting (and they arrive consistently on time!). An excellent value. Back issues available.

T-S HORIZONS

2002 SUMMIT ST.,

PORTSMOUTH, OHIO 45662

-6 issues per year for \$21.00 U.S. to Canada

(\$15.00 to the U.S.) -About 32 pages/issue. Very good production & advertising support. Has a good, consistent balance of 1000/2068 topics, with lots of software tutorial articles, and product reviews. Usually late, but always worth waiting for. Well worth the price. Back issues available.

SYNWARE NEWS

c/o THOMAS B. WOODS

P.O. BOX 64,

JEFFERSON, NH 03583

-6 issues per year for \$19.95 U.S. to Canada

(\$16.95 to the U.S.) -About 24 pages/issue. Very good production & advertising support. SWN is traditionally a ZX81/TS1000 mag. Although lots of 2068 articles are printed, the emphasis remains on the 1000. SWN's forte is in hardware and advanced programming articles, although the beginner is certainly not ignored. Delivery is on schedule (well, almost), and back issues are available. In my opinion, this is THE most technically competent publication around. Highly recommended.

SUN MAGAZINE

3224 NW 30th AVENUE,

GAINESVILLE, FLORIDA 32605

-12 issues per year for \$12.00 U.S. -About 32 pages/issue.

-Real slick production, good advertising support. Very good all-round editorial content- a real potpourri of various subject areas catering to both the 1000 and 2068. For the price, it's a steal. Although no increased rate for postage to Canada is mentioned, I'm sure an extra couple of bucks from some of us northern subscribers would not go unappreciated.

CTM

c/o CHET LAMBERT, W4WDR

1704 SAM DRIVE,

BIRMINGHAM, AL 35235

-4 issues per year for \$25.00 U.S. to Canada

(\$15.00 to U.S.) -I've never actually read a copy of CTM, but include it here because I've received so many enthusiastic recommendations from reliable sources. CTM is NOT for T/S exclusively- you'll find sections on Commodore, TI, Atari, etc. as well. The T/S coverage, however is reportedly comprehensive, timely, and well presented. More details when I get my hands on a copy.

*This is by no means a complete listing. RESOURCES continues next issue.

FOLLOWUPS:

-CALLISTO SOFTWARE, 924 2nd ST. EAST, SASKATOON, SASK. S7H 1R1 now have available the ZX software hi-res program as described last issue. The program is called GRAPHICA, and is provided with an impressive (and useful) 14-page manual, with clear explanations of all commands, and several sample listings to get you started. GRAPHICA gets my highest recommendation: it's the BEST software-only hi-res package I've seen. GRAPHICA is underpriced at \$15.00 CAN.

-CONTACT TREATMENTS: CRAMOLIN = MAGIC!

Cramolin is a hi-tech contact cleaner/preservative that all ZX81 owners should know about. (used by NASA, IBM, Armed Forces, etc., in case you want references!) There are two versions: Red, for cleaning dirty contacts, & Blue, for preserving new (clean) contacts. Cramolin was introduced to the public for the audiophile market (for treating Moving-Coil phono cartridge contacts, etc. - you can HEAR the improvement). Cramolin is available in Canada from AVALON AUDIO, 571 QUEEN ST. W., TORONTO, MSV 2B6, (416) 363-2026. The "Audio Kit" is the best approach - it includes a 2oz. bottle each of the Red and Blue concentrates for \$35.00, plus shipping if applicable. That may sound like a lot of money, but that kit should literally last you a lifetime. THE LESS YOU USE, THE BETTER!

I make a preparation as follows: get 2 bottles of Freon TF (RADIO SHACK Professional Head Cleaner, cat. no. 44-1171). Put 2 or 3 drops (!) of Red in one bottle, Blue in the other. Now put your Cramolin Kit away - the solutions you just made will likely last over a year.

Every 2 months, clean all your edge connector contacts with the Red solution, followed by a light swab of the Blue, using Q-Tips. (More often if you're constantly (un)plugging stuff.) You'll be AMAZED at the oxides & related crap that comes off even a clean-looking connector. While you're at it, treat the contacts & controls on your stereo, VCR, printer, etc.: Cramolin also makes history of "crackly" volume controls.

After a Cramolin treatment, I can pick up my computer and physically wiggle everything without causing a crash! Cramolin is also available in the U.S. from OLD COLONY SOUND LAB, P.O. BOX 243, PETERBOROUGH, NH 03458.

FROM ACROSS THE POND...

Thanks to colleague Larry Chavarie of Ottawa, (who subscribes to even more publications than I do), I will be listing a number of British concerns which continue to support the ZX81 aftermarket. MAPLIN ELECTRONIC SUPPLIES LTD., P.O. BOX 3, RAYLEIGH, ESSEX, ENGLAND SS6 8LR, tel. (0702) 554155, is the U.K. dealer for HEATHKIT, but that's only part of the picture. Maplin offers no less than 9 hardware project kits for the ZX81, including a fullsize keyboard, I/O ports, motherboards, sound and speech generators, a TV sound/inverse video kit, modem interface, extendi-RAM, and a hi-res graphics module. Prices are very reasonable. Most of these are male-only cards which are also compatible with motherboards available in the U.S. from Jonn Oliger and Budget Robotics & Computing. Maplin also still offers over 15 books about the ZX81 (with something for everyone), and publish their own electronics project magazine. 12 issues are currently available, and almost every one has a ZX81 project! (How about a ZX81 navigation/autopilot system for your yacht?!) Larry tells me Maplin gives prompt, reliable service. 450 page catalog is £1.35. If you wish to exercise the plastic, Maplin accepts Visa & Mastercard (called BarclayCard and Access in the U.K.). Check this company out!

Larry tells me Maplin gives prompt, reliable service. 450 page catalog is £1.35. If you wish to exercise the plastic, Maplin accepts Visa & Mastercard (called BarclayCard and Access in the U.K.). Check this company out!

EXTENDED BASIC:

Have you ever wished the ZX81 BASIC allowed multi-statement lines, or provided commands such as READ, DATA, RESTORE, IN, OUT, etc? Sure, lots of utilities have been around which provide these features, but most require RAND USR commands & POKEs which just aren't "friendly" BASIC. Programming genius Frits Beniest, of Holland, has come to the rescue with a superb piece of software called EXTENDED BASIC.

EX.BAS. is an actual BASIC interpreter which lives in a 3.5K long O>REM statement. Since the EX.BAS. statements are very compact, you can still write a large program in 16K. Use of EX.BAS. does not require any POKEs or RAND USR commands. EX.BAS. is activated by the statement GOSUB 0 in your program. The following line begins with REM, then the EXTENDED BASIC commands. After the REM, it's almost like Microsoft BASIC. All the commands must be typed in (spelled out). You can include as many commands in a line as you want, separated by colons. A whole new world of BASIC programming opens up, since lots of Microsoft-type commands are included.

This makes it a snap to type in some neat BASIC listings published for the IBM, Apple, TRS80, 2068, etc. which use commands that were nonexistent in ZX BASIC.

EX.BASIC provides 22 new commands, extending Display, Data & String Handling, and Input/Output control.

*DISPLAY COMMANDS include: DRAW, UNDRAW, CIRCLE, UNCIRCLE, FILL, PAPER, UNPAPER, PRINT, PRINT AT, MOVE (a window scroll), SCROLL (by N lines), CLS (fast!), COPY, SCREEN\$ (looks up character at specified screen coordinates, & returns it to a specified variable) *These 14 commands use all 24 lines.

PRINT auto-scrolls at the bottom line: no more 5/ reports!

DATA & STRING HANDLING commands include DATA, READ, RESTORE (to specified DATA line), LEFT\$, MID\$, RIGHT\$ (slice it!)

INPUT/OUTPUT CONTROL commands include KEY (like INKEY\$, but faster, and can deal with multiple keys), IN (tests an input port and returns result to specified variable), OUT (sends contents of specified variable to indicated output port.) With these commands, you can program port-mapped control or measurement interfaces from BASIC.

EXTENDED BASIC seems to be virtually crash-proof, and has 12 meaningful new report codes to tell you when you messed up. Due to the ingenious nature of the interpreter, it's incredibly fast - it can print up to 8,000 chars/sec. to the screen in SLOW mode! Due to the speed of the Display utilities, you can easily write animated games or graphics applications in EX.BAS. that rival the speed of Machine Code!

I simply cannot recommend this program highly enough. By the time you read this, it will be available from Thomas B. Woods (see p.4) Send an SASE to Tom for his new catalog - I don't know his price but it should be in the \$16.95 - \$19.95 range. Fred Nachbaur has written a 20 page manual for EX.BAS., which is loaded with examples, tutorials on the use of the "new" commands, etc. E. Arthur Brown is also distributing EX.BAS., but with the (inferior) documentation provided by the author. Until E.A. Brown makes arrangements to supply the Nachbaur manual, I'd suggest you order EX.BAS. from Tom Woods.

5/5 - OUT OF ROOM!

NEXT ISSUE: More user info and less preaching about it. Detailed user reports on the AERCO ZX-Floppy Disc system, the Oliger/T.I. Video Upgrade (both arrived too late for a detailed write-up this time), Tips on Bus Loading problems (HINT: get a Z80B CPU), and mouthwatering reviews of some tantalizing new software. More RESOURCES. See ya.

BOB'S NOTEBOOK

TS2068 INTERRUPTS

The Z80 has three Interrupt Modes (IM) two of which are of special interest to the programmer. An "interrupt" is a signal sent to the microprocessor or which generally suspends the execution of the current program, without the program being aware of it.

IM1 is the normal operating mode for the TS2068 and when an interrupt occurs, control is passed to address 56 (36h) in the ROM. This ROM routine updates the clock (FRAMES) and reads the keyboard. On exit from the routine, control is passed back to the exact place where the interrupt occurred. These interrupts take place at the rate of 60 per second.

IM2 allows us to divert interrupts to a user-generated routine and thus provides us with a powerful facility with almost limitless uses. This mode is called a vectored interrupt.

When the Z80 receives an IM2 interrupt, it expects the interrupting device (the TS2068 ULA) to place one byte of data on the data bus. This byte acts as the low order of an address; the high order comes from the I register. These two bytes are concatenated to form an address and the Z80 looks at the contents of this address for a second address to which control is vectored.

The problem with the TS2068 is that the low order byte supplied to the Z80 varies from 0 to 255 and is not just 255 (FFh) as we are told happens with the Spectrum. One technique to get around this is to create a block of addresses each filled with the same byte. The I register is changed to point to this block and IM2 is called. No matter what low order byte is supplied to the Z80, the block will produce the same address which will vector control to the start of our user-generated routine.

Meanwhile, the computer is able to carry out its main program as normal and the special routine is also acted upon so that in effect two programs are operating in tandem. This allows for some interesting applications: digital clock; automatic line numbering; creation of function keys; constant read out of memory left; tracing of basic programs; disabling NEU; smooth sprite movement; to name a few.

Provided below is a program with one of these applications: Automatic Line Numbering or AUTOLINE.

Type in listing 3 and run it. If you have made no errors, all DATA lines will be shown as OK. SAVE the program and VERIFY it.

Now RANDOMIZE USR 65024 to create the special block referred to above.

Use RANDOMIZE USR 65120 to start the autoline feature and USR 65124 to stop it. If you use NEU, RANDOMIZE USR 65024 AND USR 65120 again before proceeding.

You should CLEAR 64255 before using the program.

The step between line numbers is set at 10; you can change this: POKE 65192, S where S is the required step.

To alter the next line number, delete the one printed and type in the next number required.

If the line number exceeds 9999 a colon will be printed in the first position to warn that the line cannot be entered.

Be sure to turn the program off before overwriting any of the code used by the program.

Listing 1 is a sample "mother" program used to generate the block of bytes and set up the vectoring.

Listing 2 is the disassembled version of AUTOLINE code.

AUTOLINE was adapted for the TS2068 from a program printed in Your Computer December 1983.

Bob Mitchell Aug 85.

FE00 C5	PUSH BC
FE01 D5	PUSH DE
FE02 E5	PUSH HL
FE03 F5	PUSH AF
FE04 2100FB	LD HL,FB00
FE07 0600	LD B,00
FE09 36FC	LD (HL),FC
FE0B 23	INC HL
FE0C 10FB	DJNZ FE09
FE0E 36FC	LD (HL),FC
FE10 3EC3	LD A,C3
FE12 32FCFC	LD (FCFC),A
FE15 2169FE	LD HL,FE69
FE18 22FDFC	LD (FCFD),HL
FE1B 3EFB	LD A,FB
FE1D ED47	LD I,A
FE1F F1	POP AF
FE20 E1	POP HL
FE21 D1	POP DE
FE22 C1	POP BC
FE23 C9	RET

LISTING 1

```

FE60 ED5E      IM      2
FE62 C9        RET
FE63 00        NOP
FE64 ED56      IM      1
FE66 C9        RET
FE67 00        NOP
FE68 00        NOP
FE69 FF        RST      38
FE6A F3        DI
FE6B F5        PUSH     AF
FE6C E5        PUSH     HL
FE6D D5        PUSH     DE
FE6E C5        PUSH     BC
FE6F 3A68FE    LD      A,(FE68)
FE72 FE00      CP      00
FE74 2027      JR      NZ,FE9D
FE76 3A825C    LD      A,(5C82)
FE79 FE20      CP      20
FE7B 2071      JR      NZ,FEEF
FE7D 3A835C    LD      A,(5C83)
FE80 FE17      CP      17
FE82 206A      JR      NZ,FEEF
FE84 21085C    LD      HL,5C08
FE87 7E        LD      A,(HL)
FE88 FE0C      CP      0C
FE8A 2362      JR      Z,FEEF
FE8C 21045C    LD      HL,5C04
FE8F 7E        LD      A,(HL)
FE90 FE0D      CP      0D
FE92 2804      JR      Z,FE98
FE94 FEF7      CP      FF
FE96 2056      JR      NZ,FEEF
FE98 3E04      LD      A,04
FE9A 3268FE    LD      (FE68),A
FE9D 3A68FE    LD      A,(FE68)
FEA0 3D        DEC      A
FEA1 3268FE    LD      (FE68),A
FEA4 2A495C    LD      HL,(5C49)
FEA7 110A00    LD      DE,000A
FEA8 19        ADD      HL,DE
FEAB 0118FC    LD      BC,FC18
FEAE CDD1FE    CALL    FED1
FEB1 FE03      CP      03
FEB3 2839      JR      Z,FEEF
FEB5 019CFF    LD      BC,FF9C
FEB8 CDD1FE    CALL    FED1
FEBB FE02      CP      02
FEBD 282F      JR      Z,FEEF
FEBF 01F6FF    LD      BC,FFF6
FEC2 CDD1FE    CALL    FED1
FEC5 FE01      CP      01
FEC7 2825      JR      Z,FEEF
FEC9 01FFFF    LD      BC,FFFF
FECB CDD1FE    CALL    FED1
FECF 181D      JR      FEEF
FED1 AF        XOR      A
FED2 09        ADD      HL,BC
FED3 3C        INC      A
FED4 38FC      JR      C,FED2
FED6 ED42      SBC      HL,BC
FED8 3D        DEC      A
FED9 C630      ADD      A,30
FEDB E5        PUSH     HL
FEDF 21085C    LD      HL,5C08
FEE0 77        LD      (HL),A
FEE3 C8EF      LD      A,(5C3B)
FEE5 213B5C    SET      S,A
FEE8 77        LD      HL,5C3B
FEE9 E1        LD      (HL),A
FEEA 3A68FE    POP      HL
FEED C9        LD      A,(FE68)
FEEF C1        RET
FEF0 D1        POP      BC
FEF1 E1        POP      DE
FEF2 FB        POP      HL
FEF3 C9        POP      AF
                EI
                RET

```

LISTING 2

```

1 REM AUTOLINE
120 LET a=10: LET b=11: LET c=1
2: LET d=13: LET e=14: LET f=15
130 LET line=1000
140 LET address=65024+(line-100
0)*6.4
150 RESTORE line
160 READ s$,sum
170 LET tot=0
180 LET byte=16*VAL s$(1)+VAL s
$(2)
190 LET tot=tot+byte
200 POKE address,byte
210 LET s$=s$(3 TO )
220 LET address=address+1
230 IF s$(">") THEN GO TO 180
240 POKE 23692,255
250 IF sum=tot THEN PRINT "Line
";line;" OK.": LET line=line+1:
GO TO 150
260 PRINT "Error in line ";line
270 BEEP .4,-10: BEEP .4,-16
280 STOP
300 SAVE "AUTOLINE": VERIFY ""
310 STOP
1000 DATA "C5D5ESF52100FB060036F
C2310FB36FC3EC332FCFC2169FE22FDF
C3EFBED47F1E1D1C1C90000000000000
00000000000000000000000000000000
0000000000",5520
1001 DATA "000000000000000000000000
00000000000000000000000000000000
0000000000ED5EC90ED56C90000FFF
3F5E5D5C53A68FEFE0020273A825CFE2
020713A835C",4171
1002 DATA "FE17206A21085C7EFE0C2
86221045C7EFE0D2804FEFF20563E043
268FE3A68FE3D3268FE2A495C110A001
90118FCCDD1FEFE032839019CFFCDD1F
EFE02282F01",6612
1003 DATA "F6FFCDD1FEFE01282501F
FFFCDD1FE181DAF093C38FCED423DC63
0E521085C773A385CCBEF213B5C77E13
A68FEC9C1D1E1F1FBC900000000000000
000000000000",7492

```

LISTING 3

"On Printing SENSE with DOLLARS"

The following is a short little subroutine which I use to print Dollars and Cents with trailing zeros after the decimal point as required, and a zero before the decimal point when there are no dollars. It also prints a unary minus sign after the figures for negative amounts. The variable "X" can be assigned a value in your program so that, until changed, it will print the Dollars and Cents in column with the Decimal point in "X" column. Assignment in a FOR/NEXT loop, for instance, can give you several repeating columns. Variable "M" must be assigned in your program with the amount you wish to print.

```

100 REM PRINT DOLLARS & CENTS
110 LET CN=INT (100*ABS M+.5)-1
00=INT ABS M
120 PRINT TAB X-1-LEN STR$ INT
ABS M;"$";INT ABS M+INT (CN/100)
;".";"0" AND CN<10);(CN AND CN<
100);("0" AND CN=100);("-" AND M
<0);
130 RETURN

```

Graphics For Your ZX-81

The following collection of routines is designed to allow the user of the ZX-81 to do the functions that are listed below

- 1- Draw Pictures
- 2- Store Pictures In Memory to be displayed sequentially
- 3- Save Pictures To Tape
- 4- Load Pictures From Tape

The procedures are as outlined

- 1 use the M/C loader routine to load the machine code.
- 2 enter the NEW command
- 3 load the draw program
- 4 enter the NEW command

- 5 load either the display, rtn or the save rtn.
- 6 if the picture has been saved to tape then load the load picture routine
- 7 to save more than 1 picture repeat the steps 2 thru 5

The M/C routines are listed below.

- 1 store picture to memory

```
2A 0C 40 11 30 75 01 19 03 ED
B0 C9
```

The inverse digits are the destination address.

- 2 display picture from memory

```
21 30 75 ED 5B 0C 40 01
19 03 ED B0 C9
```

The inverse is the source address.

- 3 save picture to tape

```
2A 0C 40 ED 5B 10 40 01
19 03 ED B0 C9
```

The inverse is the destination.

- 4 load picture from tape

```
2A 10 40 ED 5B 0C 40 01 19 03
ED B0 C9
```

A suitable location for the safe storage of the M/C is

above 30000.

To set ram top to 30000 do the next commands.

```
POKE 16388,48
POKE 16389,117
```

Store the M/C routines to a location that is at least 793 bytes above the address that is selected to hold the 1st picture.

The following BASIC PROG can be used to perform the tasks that are listed above.

For RTN-2

```
5 REM RTN-2
10 CLS
20 RANDOMIZE USR N
30 STOP
```

For RTN-3

```
5 REM RTN-3
10 DIM S$(793)
20 RANDOMIZE USR N
30 STOP
```

FOR RTN-4

```
5 REM RTN-4
10 CLS
20 RAND USR N
30 STOP
```

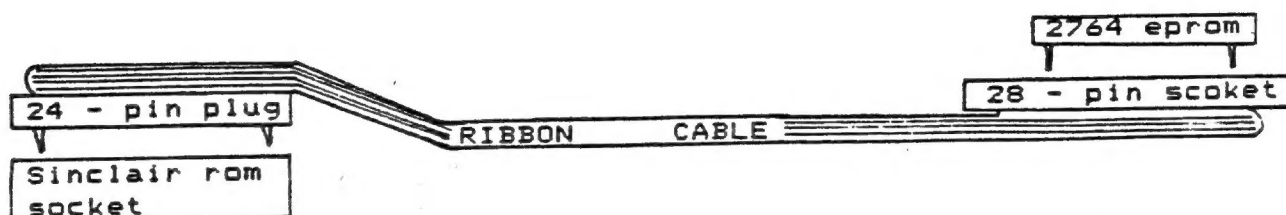
```
5 REM "draw"
10 PRINT "S=r,8=l,6=u,7=d,l=l,
r=r,c=d,m=u"
15 PRINT "-----"
20 LET x=0
30 LET y=0
40 LET x=x-(INKEY$="8")+(INKEY$="5")
50 LET y=y-(INKEY$="7")+(INKEY$="6")
60 IF INKEY$="s" THEN GOTO 200
70 IF INKEY$="c" THEN GO TO 95
75 IF INKEY$="m" THEN GO TO 13
80 PLOT x,y
90 GO TO 40
95 REM unplot x,y
100 LET y=y-1
105 REM unplot x,y
110 PLOT x,y
120 GO TO 40
130 REM unplot x,y
134 LET y=y+1
145 PLOT x,y
150 GO TO 40
155 REM unplot x,y
160 LET x=x-1
165 PLOT x,y
168 GO TO 40
175 REM unplot x,y
180 LET x=x+1
185 PLOT x,y
190 GO TO 40
200 RAND USR N
210 STOP
```

This is the sketch program

Continued on page 12

24 - PIN SINCLAIR ROM TO A 28 - PIN ADAPTER EPROM

Parts list. 1: 28 pin dip socket (RS 276-1997)
1: 24 pin dip plug or 24 pin wire wrap socket
Some 24 wire ribbon cable



Page 9

~~TELECOM~~

by David C. Ridge

Well, I hope we wet your appetite for telecommunications in the first column. I also hope that you all ran out to purchase your 2050 modems. In the last column we teased you with hints of all the wonderful things that can be done with your modem. Now I will get down to detail about how you actually do it!

One of the most exciting and popular uses of your modem is to communicate with CompuServe. CompuServe is a huge database where you can interact with other computer enthusiasts on topics of every imaginable kind! CompuServe is well on the way to creating a concept of North America as the "electronic village". It is indeed the central nervous system of the computer cult in North America.

A detailed description of everything that CompuServe offers would more than fill the entire newsletter. Everything from movie reviews to computer clubs. Almost anything that can be put into print is on CompuServe. Perhaps I can give you an idea of the possibilities by sharing with you my personal experiences and favourite uses of the system. There is a Timex/Sinclair club or SIG (special interest group) on CompuServe and as a dedicated Timex/Sinclair fanatic I quite naturally spend a great deal of time there.

This SIG, and indeed all SIGs are open to any person on CompuServe. I should point out that you do not need a Commodore computer to visit the Commodore SIG or an Apple to visit the Apple SIG. Your 2050 modem will allow you to communicate in a standard format used by most BBS's and computers as long as they use the 300 baud rate of communication. Most sigs consists of two main features. The message base and the data library. The message base is simply a public bulletin board where all of the Timex users on the system interact and communicate with each other. This is very useful because we all share our knowledge. If someone in Alaska has been burned by an unscrupulous retailer then we all know about it! If there is a fantastic new product out that some one in New Jersey has just received, then we all know about it! If you have a question that nobody in your circle of friends is able to solve simply put up a message asking for some help and call the system back in a day or two.

There will probably be five or six answers and suggestions waiting for you! If you would rather communicate privately with another user then you can use the CompuServe electronic mail system called EASYPLEX. Everyone is very friendly and willing to help. I feel that I have made many new friends on CompuServe by communicating with them several times in this manner and the amazing thing is that I have never met them!! I have no idea where they live or what they look like but we communicate regularly!

~~22~~(2)

There are many other features that I find useful on CompuServe. There is the Associated Press news SIG which gives the REAL news as the newspapers receive it! Not just the watered down version which you and I receive in the paper! This is updated every hour. There is a SIG for many popular professions such as Doctors, Lawyers, Engineers, etc. I am a dog lover so I spend some time on the Veterinary SIG. On this SIG, veterinarians discuss the latest developments in their noble profession. Now don't get the idea that CompuServe is all recreation. I have recently put the system to a very novel business use. I am in the business of motorcycle service management. I was putting together a study on how to improve the service dept. Part of this study involved a survey of customers to ask what their likes and dislikes are concerning the service departments that they have dealt with. I thought to myself "wouldn't it be great if I could carry out the survey on CompuServe!?"

So I logged on to the system and called up the subscriber directory. The subscriber directory is a list of voluntarily posted information about yourself, your interests and your computers. By posting such information about yourself, other people with similar interests can easily find and communicate with you. I put in a search string of "MOTORCYCLE" and to my surprise, received a listing of over two hundred users who had posted motorcycles as one of their interests. I then selected 50 names at random and sent them each a small EMAIL message stating that I would be interested in their ideas and suggestions for the way a service department should run. The response was good and I successfully carried out the survey from the comfort and privacy of my home!

The data library in each SIG is a collection of public domain software and articles which you are invited to download (receive) for free! You can get some excellent programs and reviews over the phone line. You are also invited to contribute (upload) anything you would like to the data library.

So by now you must be muttering to yourself "OK, OK how do I join CompuServe and how much does it cost"! To join CompuServe all you have to do is walk into your favourite computer store and ask for a CompuServe starter kit. This kit consists of a binder of information about the system, 5 free connect hours, one year subscription to Online Magazine, your permanent ID number and a temporary password (you will receive your permanent password when you log on and register). The going price in Toronto for the kit is \$59.95. This is the only fee you ever pay to join CompuServe. After your 5 free hours run out, you will be billed for connect time only. At the time of this writing I believe the charges for connect time are \$5.25 U.S. Even though CompuServe is based in Ohio, it is not a long distance number. Every metropolitan center has a local network access number and the charges for using this link are 25 cents per hour which is added to your monthly CompuServe bill. The most convenient method of billing is through a credit card. You simply give the card number to CompuServe and they will bill you monthly. Other billing methods can be arranged however.

Well thats all for this month. Next time we will get into some technical tricks such as uploading/downloading programs and sending TADWORD files. Remember I can be reached on CompuServe anytime. My ID# is 70416,1435. As we say on the boards.....read you later!

A REVIEW OF THE
LARKEN DISK DRIVE
BY GREG LLOYD

Less than two months ago I purchased a Larken Disk Drive Interface for my 2068 computer and since then life has been spinning at 125 k bits per second. It is a fast way to load and save all your programs and data.

For a price less than \$300 you too can be whirring and spinning with a real Floppy system. The disc interface comes from Larken with a system disc, user instructions, assembly details and all the plugs and cables for signal and power. You get to build or purchase a power supply and the disk drive.

My own system includes the interface card, a power supply and the Shugart SA 455 Disc Drive itself. I didn't hunt too long for the bits and pieces but someone willing to spend a little time is bound to do better than the \$225 mark. The disc drive business being what it is these days, you can find all sorts of discounted IBM COMPATIBLE disk drives around.

The system works on both the 2068 and Spectrum Rom so that having enough programs to put on the system is no problem! The discs can hold up to 160K of data. There is only one thing about the system that is less than fantastic. That is the fact that most of the software developed for both these computers is cassette based and therefore uses memory to the fullest, as would be and should be expected. The problem with this is, where do you put the 4K Disk Operating System (LDOS-LARKEN DOS)?

The answer is everywhere! The system disk has two versions of the LDOS one to sit at 28000 and another to sit at 48000. There is, I am told a version that will sit in a Ram statement (2k long) and use part of the display file as a read/write buffer. Another version is entirely in the display file. These last two versions I cannot review as they were not available when I purchased my system. In theory, you would have the entire memory to work with in the display file version.

The LDOS is also on a 2 K eeprom on the interface card. The ram space used by the DOS is 4K. I have been able to save a great number of programs on the disk with just the resident eeprom (61000 and up) version of DOS. It works with a Print USA 63488 call after you have lowered ramtop to 61000. The LDOS can be called from a program or in command mode. You can SAVE, LOAD, FORMAT new disks, DELETE files, check you disks with BADBLOCKS and List the contents of your disk with DIRECTORY. Basic programs when saved will include all variables and data. It is also possible to SAVE an ARRAY or a Block of Code. Presently code is loaded into the same spot it was saved from.

As a graphic example of the improvement in load times here is a list of Larken DISC loading times for :

Tasword II 10 seconds
(just the program)

Vu-calc 4 seconds
(just the program)

Vu-calc data 7 seconds
(full grid data in all cells)

CHESS 5 seconds

ANY SCREEN\$ 1 second

To the best of my knowledge this system is the only one that is compatible with Spectrum and 2068. It may not be as user friendly as the cassette system but it sure is faster. I know of no other system available that offers so much for such a low price. For further DISCUSSION leave a message for me on ENVOY 100 MESSAGING SYSTEM or contact me through the Club.

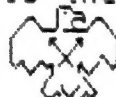
P.S. You don't need to flip your floppy it double sided.

Graphics - cont.

```
5 REM machine code loader
10 LET x=30000+n
15 REM
16 REM n is an arbitrary value
17 REM
20 REM LET A$=" machine code

21 REM
22 FOR b=1 TO c STEP 2
23 REM c = the length of the
M/C routine - 1
30 POKE x,16+CODE A$(b)+CODE a
$(b+1)-476
40 LET x=x+1
50 NEXT b
60 STOP
```

This is the M/C loader prog.



MIKE LEMYRE

Postmaster, if Undelivered Return to :

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